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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/678,301	10/06/2003	Hiroo Takizawa	Q77851	4148

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EXAMINER	
ANGEBRANNDT, MARTIN J	

ART UNIT	PAPER NUMBER
1756	

DATE MAILED: 04/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/678,301	TAKIZAWA ET AL.	
	Examiner	Art Unit	
	Martin J. Angebranndt	1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 April 2006*.

2a)☐ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. *04/11/2006* .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

1. This office action is supplemental to the previous office action and restarts the period for response. This office action incorporates the references, PTO-1449 and PTO-892 of the previous office actions, so these are not doubled in the record.

2. The examiner notes that the applicant has cited Hamer at [0174] and notes that most if not all of the cyanine, merocyanine and oxazol compounds are rendered obvious by this 1964 reference, if they are not outright anticipated. This book has 790 pages and the examiner will cite it as needed in the future. The examiner notes that the likelihood or obtaining a patent relating to methods using the two photon excitation are much better than attempting the gain coverage for the dyes or media containing the dye. (optical recording media commonly have a binder and when these dyes are used as filter dyes in photographic processes, the binder is gelatin (see examples of the application))

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-14 and 18-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The language "undergoing a non-resonant two-photon absorption" is unclear. In single photon excitation, there is a ground state, which is the starting point and an excited state which is the ending point. In two or multiphoton transitions, there is the ground state, at least one intermediate state and the excited state. In both cases the transitions are quantized as the fully energy of the photon is absorbed and there are no other (incremental) states in the transition. There is not difference in the ground and excited states of single and multiphoton excitations

It is not clear if the claim language embraces the starting point, (the ground state) and the ending point (excited state). As the process is not continuous, the claims language makes little sense. If the applicant wishes the claim the dye excited to the intermediate (metastate state), the applicant should indicate that the dyes has only absorbed one of the photons in the multiphoton process. There are issues with this as the metastable/intermediate state is extremely short lived (fs to ns lifetimes) and only has utility when further excited. (ie the intermediate state by itself cannot induce polymerization, fluorescence or anything else.) If the second photon is not absorbed when it is in the metastable state, it returns to the original ground state. The two photon cross section is a measure of the transition probability of both photons being absorbed. The probability for the first photon to be absorbed is much higher due to the long lifetime of the ground state of the compound, relative to the short lifetime of the metastable/intermediate state, so the intermediate state will be often reached by excitation, but will relax back to the ground state without effecting any change in the compound.

For the purposes of examination, the claims have been read to embrace the ground, excited state and any intermediate/metastable states.

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-6,10-15 and 17-19 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Rentzepis et al. '324.

See figure 1 and the merocyanine illustrated there. The discussion of for `this example appears in column 16. Note the discussion on column 15 concerning the fact that there is no real intermediate state and therefore the absorption is non-resonance. The laser is a 1064 nm output of a Nd:YAG.

The ground , intermediate and excited state are disclosed in this reference.

8. Claims 1-6,10-15 and 17-20 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Lee et al., "Two photo radical photointiator system based upon iodiniated benzospiraopyrans" Chem. Mater. Vol. 3 pp. 858-846 (1991).

See experiments described on page 860.

The ground , intermediate and excited state are disclosed in this reference.

9. Claims 1-4,8-15 and 17-20 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Foucault et al. "Two photon absorption in organic dyes....", Opt. Commun. Vol. 15(3) pp. 412-415 (11/12-1975)

See figure 1, where Cy 1, Cy2, Cy3 and Cy4, which are cyanine dyes are shown to have been subjected to single and two photon excitation processes. These are indolenic cyanine dyes.

(X1 and X2 in formula 4 of the present claims is C(CH3)2.). The two photon excitation uses a 1064 nm YAG laser.

Claims 5-10 do not require that the two photon dye be any one of the particular groups.

The ground , intermediate and excited state are disclosed in this reference.

10. Claims 1-20 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Kasatani et al. "Short wavelength fluorescence caused by sequential ....", Chem. Phys. Vol. 83, pp. 461-469 (1984)

See where DOC, DODC, DOTC, DTC, DTDC and DTTC are described section 2. DOC, DODC, and DOTC are oxazole dyes (X1 and X2 in formula 4 would be O). DTC, DTDC and DTTC are thiazole dyes (X1 and X2 are S). A flashlamp pumped dye laser is used to determine the two photon absorption spectrum (ie the peak of which is at 305 nm, so the two photons are double this wavelength (ie. 620 nm). The fluorescece is measured

Claims 5-10 do not require that the two photon dye be any one of the particular groups.

The ground , intermediate and excited state are disclosed in this reference.

11. Claims 1-4 and 8-20 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Naqvi et al., "On the long lived transient ...", Chem. Phys. Lett., Vol. 22(2) pp. 226-229 (10/1973).

See figure 1, where quinolinic cyanine dyes DDI and cryptocyanine are used. shown. The measurement of fluorescnec is also described in figure 3. The two photon excitation use a ruby laser (694.3 nm light).

Claims 5-10 do not require that the two photon dye be any one of the particular groups.

The ground , intermediate and excited state are disclosed in this reference.

12. Claims 1-4 and 8-15 and 17-20 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Penzkofer eta l., "S0 and S1 two photon absorition dymanics of organic dye solutions". Opt & Quantum Electron. Vol. 19 pp. 327-349 (1987).

Two methine dyes HMICI and PYC are shown on page 332. A YAG laser 1054 nm is used to determine the two photon absorption spectrum. Dye aggregation is described on page 332. The fluorescece is measured and shown in figure 5. Two methine dyes HMICI and PYC are shown on page 332.

Claims 5-10 do not require that the two photon dye be any one of the particular groups.

The ground , intermediate and excited state are disclosed in this reference.

13. Claims 1-20 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Soini et al. '738.

See examples relating to the cyanine dyes in table 1, where oxazole, indole and thiazole cyanine dyes are used as the TPA chromophore. The excitation wavelengths are 578-772 nm and the emission wavelengths are 605-820 nm. See example 8.

The ground , intermediate and excited state are disclosed in this reference.

14. Claims 1-20 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Iketaki et al. '830.

See cyanines at 11/22-23,11/33-35,11/40-41,11/46,11/61,11/63-65,12/1-2,12/4-5, 12/11-13 and 12/16-21.

The ground , intermediate and excited state are disclosed in this reference.

15. Claims 1-14 and 18-20 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Namba et al. '623.

See cyanine dyes used in examples, particularly those using a binder. Examples 1 and 3 and 7 show exemplitive dyes. Note breadth of formula I in column 5.

The ground and excited states are taught in this reference. If these are exposed to light of any wavelength, an intermediate state or the excited state will be formed based upon the electronic structure of the compound and in the case of the intermediate state forming, the low intensity of light will allow it relax back down to the ground state as discussed above.

16. Claims 1-14 and 18-20 are rejected under 35 U.S.C. 102(b) as being fully anticipated by FR 2291256.

See thiobarbituric oxanol dyes on pages 7 and 10.

The ground and excited states are taught in this reference. If these are exposed to light of any wavelength, an intermediate state or the excited state will be formed based upon the electronic structure of the compound and in the case of the intermediate state forming, the low intensity of light will allow it relax back down to the ground state as discussed above.

17. Claims 1-14 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Sanford '647.

See thiobarbituric oxanol dye in column 19.

The ground and excited states are taught in this reference. If these are exposed to light of any wavelength, an intermediate state or the excited state will be formed based upon the electronic structure of the compound and in the case of the intermediate state forming, the low intensity of light will allow it relax back down to the ground state as discussed above.

18. Claims 1-14 and 18-20 are rejected under 35 U.S.C. 102(b) as being fully anticipated by JP 03-231741.

See barbituric oxanol dye AI-19-AI-26 on pages 5 and 6 and the cyanine dyes shown in the upper left hand column of page 12.

The ground and excited states are taught in this reference. If these are exposed to light of any wavelength, an intermediate state or the excited state will be formed based upon the electronic structure of the compound and in the case of the intermediate state forming, the low intensity of light will allow it relax back down to the ground state as discussed above.

19. Claims 1-14 and 18-20 are rejected under 35 U.S.C. 102(b) as being fully anticipated by JP 2001-260536.

See thiobarbituric oxanol dyes on page 17.

The ground and excited states are taught in this reference. If these are exposed to light of any wavelength, an intermediate state or the excited state will be formed based upon the electronic structure of the compound and in the case of the intermediate state forming, the low intensity of light will allow it relax back down to the ground state as discussed above.

20. Claims 1-14 and 18-20 are rejected under 35 U.S.C. 102(b) as being fully anticipated by JP 63-288786.

See cyanine dyes and merocyanine dyes of the formulae shown on page 3 and as exemplified as dyes A-D on page 4.

The ground and excited states are taught in this reference. If these are exposed to light of any wavelength, an intermediate state or the excited state will be formed based upon the electronic structure of the compound and in the case of the intermediate state forming, the low intensity of light will allow it relax back down to the ground state as discussed above.

21. Claims 1-14 and 18-20 are rejected under 35 U.S.C. 102(b) as being fully anticipated by JP 60-239948.

See cyanine dyes and merocyanine dyes of the formulae shown on page 2 and as exemplified as dyes in the table bridging pages 2-5.

The ground and excited states are taught in this reference. If these are exposed to light of any wavelength, an intermediate state or the excited state will be formed based upon the electronic structure of the compound and in the case of the intermediate state forming, the low intensity of light will allow it relax back down to the ground state as discussed above.

22. Claims 1-14 and 18-20 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Sprague '193.

See merocyanine dyes of exemplified in columns 7 and 8.

The ground and excited states are taught in this reference. If these are exposed to light of any wavelength, an intermediate state or the excited state will be formed based upon the electronic structure of the compound and in the case of the intermediate state forming, the low intensity of light will allow it relax back down to the ground state as discussed above.

23. Claims 1-14 and 18-20 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Brooker '807.

See merocyanine dyes of exemplified on page 2.

The ground and excited states are taught in this reference. If these are exposed to light of any wavelength, an intermediate state or the excited state will be formed based upon the electronic structure of the compound and in the case of the intermediate state forming, the low intensity of light will allow it relax back down to the ground state as discussed above.

24. Claims 1-14 and 18-20 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Deboer et al. '977.

See oxonol dyes shown in columns 3 and 4.

The ground and excited states are taught in this reference. If these are exposed to light of any wavelength, an intermediate state or the excited state will be formed based upon the electronic structure of the compound and in the case of the intermediate state forming, the low intensity of light will allow it relax back down to the ground state as discussed above.

25. Claims 1-14 and 18-20 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Murai et al. '138.

See cyanine dyes with solubilizing groups exemplified shown in columns 49 and 50.

The ground and excited states are taught in this reference. If these are exposed to light of any wavelength, an intermediate state or the excited state will be formed based upon the electronic structure of the compound and in the case of the intermediate state forming, the low intensity of light will allow it relax back down to the ground state as discussed above.

26. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned

with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

27. Claims 1-20 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-13 of copending Application No. 10/892306 (US 2005/0019711). Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims specifically recite the use of a cyanine, merocyanine or oxanol dye (claims 6-7) as well as its use in two photon processes.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

28. Claims 1-20 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-40 of copending Application No. 10/874344 (US 2005/0003133). Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims specifically recite the use of a methine dye (claim 36) as well as its use in two photon processes.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

29. Claims 1-20 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-26 of copending Application No. 10/849519 (US 2004/0245432). Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims specifically recite the use of a cyanine, merocyanine or oxanol dye (claim 3) as well as its use in two photon processes.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

30. Claims 1,2 and 15-20 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-26 of copending Application No. 10/679446 (US 2004/0131969). Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims specifically recite the use of a cyanine, or methine dye as well as its use in two photon processes.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

31. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J. Angebranndt whose telephone number is 571-272-1378. The examiner can normally be reached on Monday-Thursday and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Martin J Angebranndt

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